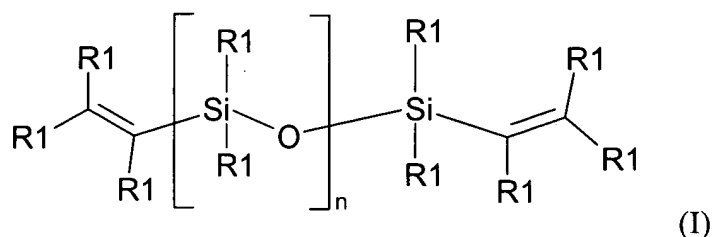


[0007] Still other efforts at modification of the elastomeric cross-linked siloxanes have included variations on the addition polymerization reaction of a polyorganohydrosiloxane ~~an polyorganohydrosiloxane~~ (a siloxane having Si-H bonds) and an unsaturated polyorganosiloxane. This hydrosilylation reaction is typically carried out in the presence of a catalyst, typically platinum. One variation is to graft alkoxy or alkoxyol groups onto the silicone backbone (US 6,331,604, incorporated herein by reference in its entirety). Another variation has been to use a non-silicone unsaturated molecule to crosslink the polyorganohydrosiloxane or to extend the size of the silicone cross links (US 5,880,210, incorporated herein by reference in its entirety). Yet other variations have been to introduce polyethoxy or polypropoxy or polyethoxy/polypropoxy bridges into the cross-linked polymer (EP 0545002, incorporated herein by reference).

[0013] These and other objects of the invention are surprisingly achieved by a polymerizing an polyorganohydrosiloxane having a molecular weight of about 3500 to about 4000 and 6-7 Si-H bonds per molecule with a ~~lower alkylene~~ lower alkylene terminated polydimethylsiloxane having a molecular weight of about 20,000 to about 25,000 in the presence of a medium selected from low viscosity silicone oils, hydrocarbon oils (typically with the aid of a hydrosilylation catalyst), where the amounts of the siloxanes are chosen such that the reaction product constitutes about 3% to about 15% of the cross-linked polymer and about 97% to about 85% of the reaction medium. During the polymerization reaction, shear is kept to a minimum to allow for the optimal growth of the polymer. The resultant swollen gel is then milled in a colloid mill, and if desired, diluted to a concentration of about 3% to about 8% with a diluent selected from the group consisting of low viscosity silicone oil, hydrocarbon oil, lower alkanol, or mixtures thereof. The so produced gel is useable as is or can be formulated into more complex cosmetic

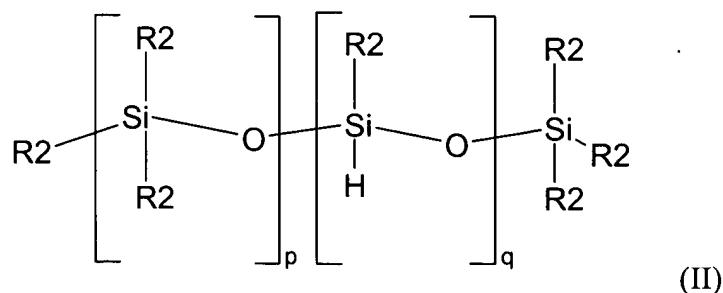
formulations having about 65 to about 99.9% of the gel, about 20% to about 30% of other non-diluent cosmetic materials (materials that are not low viscosity silicone oil, hydrocarbon oil, or lower alkanol), and up to about 5% lower alkanol.

[0020] The α,ω -di ~~loweralkenyl~~ lower alkenyl terminated polyorganosiloxane is of formula I:



and has a molecular weight of about 20,000 to about 25,000, (preferably about 21,000 to about 24,000, more preferably about 22,000 to about 23,000, even more preferably about 22,250 to about 22,750, most preferably about 22,400 to about 22,600) with n being about 265 to about 340 (preferably about 275 to about 330, more preferably about 285 to about 320, even more preferably about 295 to about 305, still more preferably about 300) and each R1 being independently H, or an alkyl group of 1 or 3 carbons.

[0021] The ~~polyorganohydrosiloxane~~ polyorganohydrosiloxane used in the invention is of formula II:



where the molecular weight of reactant II is about 3500 to 4000 (preferably about 3600 to about 3900, more preferably about 3700 to about 3800, still more preferably about 3725 to about 3775, still more preferably about 3740 to about 3760); q is about 5 to about 9; p is about 40 to about 50, and each R₂ is independently an alkyl of 1-3 carbon atoms.

[0022] Optionally, the reaction may take place in the presence of a mono- α -olefin or a polyalkoxylated mono- α -olefin to result in grafting onto the resulting polymer the hydrogenated olefin. Use of these "grafts" allows for adjustments in the hydrophilic/hydrophobic nature of the gel. When hydroxyl-terminated α -olefin is utilized (such as that prepared from 1-hydroxy-1-alkynyl compounds and ethylene oxide, propylene oxide, or mixtures thereof), the olefin can cross-link the α,ω -~~di loweralkenyl~~ di lower alkenyl terminated polyorganosiloxane since both the unsaturated bond and the hydroxyl group can react with the Si-H bonds of the ~~polyorganohydrosiloxane~~ polyorganohydrosiloxane, allowing further fine tuning of the pore size or voids, which depends upon the relative amount of the hydroxyl-terminated α -olefin and the separation distance of the hydroxyl group from the unsaturated bond therein. Further details on grafting groups onto silicones are disclosed in US 6,331,604, which is incorporated herein in its entirety by reference.

[0023] Generally, the reaction medium (the low molecular weight silicones and/or the hydrocarbon oil) is placed in a suitable vessel and the compounds of formulae I and II and any optional olefin are added with mixing. The temperature is generally adjusted to about 20°C. to about 50°C. and the reaction catalyst is added while mixing and shearing forces are now controlled. The control of shearing forces is achieved by allowing for gentle Gentle mixing is to

be continued until visible gelling has taken place (about 5-40 minutes), after which mixing and heating are halted to allow the reaction to proceed without breaking down the gelling matrix. In a preferred method, a small blade (relative to the vessel size) is used for mixing, which because of its smaller size does not move the entire mass simultaneously. This allows for greater variability in the point at which mixing is stopped in that the stopping point is not as critical. Somewhat overshooting the visible gel formation point is acceptable because a substantial portion of the reaction mass is able to extend the polymer network even though the mixing is continuing. Nonetheless, mixing should be stopped shortly afterwards. In a preferred embodiment, the polymerization reaction is conducted in the substantial absence of shearing forces. The gelling reaction is allowed to continue for about at least about 2 hours, preferably at least about 3 hours, more preferably at least about 4 hours and continues until a bouncy gel is formed. Generally, the reaction is complete by about less than 24 hours, but in some cases longer times may be needed.